

Claims

1. In a process for biological treatment of a suspension in a bioreactor in which to circulate the suspension, at least some of the suspension is routed through a vertically aligned guide zone so that a vertical flow of at least a portion of the suspension is produced, which flow proceeds into the area of the suspension fill level or from the area of the suspension fill level, the improvement comprising passing a fluid in the area of the suspension fill level so as to cause rotary flow of the surface of the suspension and/or the top scum floating on the surface of the suspension.

2. Process according to claim 1, wherein the fluid is fed into the bioreactor via nozzles that are mounted tangentially on the periphery of the tank.

3. Process according to claim 1 and 2, wherein the suspension that is suctioned off from the bioreactor is used as a fluid.

4. Process according to claim 2 and 3, wherein the nozzles are supplied with fluid at different times.

5. Process according to one of claims 2 to 4, wherein the nozzles are operated with a common pump and are successively supplied from the latter by means of cyclic switching of the series.

6. Process according to one of claims 1 to 5, wherein at least a portion of the top scum floating on the surface of the suspension in the rotary flow is removed via at least one top scum outlet on the inside wall of the bioreactor in the area of the suspension fill level.

7. Process according to claim 6, wherein the top scum is washed into the top scum outlet by means of a fluid supplied in the vicinity of the top scum outlet.

8. Process according to claim 7, wherein a fluid that keeps the top scum in motion and wets it is delivered opposite the top scum outlet.

9. Process according to claim 8, wherein the fluid is delivered via a nozzle that is provided in the vicinity of the top scum outlet with a momentum such that the top scum is conveyed into the top scum outlet.

10. Process according to one of claims 1 to 9, wherein the fluid is delivered with a flow velocity of from 10 to 15 m/s.

11. Process according to one of claims 1 to 10, wherein the fluid is delivered with a volumetric flow rate of from 300 to 600 m³/h.

12. Device for biological treatment of a suspension with a bioreactor for receiving the suspension, in the interior of the bioreactor there being a guide means that extends into the area of the suspension fill level with a vertical alignment for circulating the suspension, wherein there is at least one nozzle for feeding a fluid into the bioreactor in the area of the suspension fill level.

13. Device according to claim 12, wherein the nozzle can be supplied with the suspension via a feed line that is connected to the interior of the bioreactor via a pump.

14. Device according to claims 12 and 13, wherein there are several nozzles distributed in the area of the suspension fill level on the periphery of the bioreactor.

15. Device according to claims 12 to 14, wherein there is a top scum outlet that is attached radially to the inside wall of the bioreactor in the area of the suspension fill level.

16. Device according to claim 15, wherein there is a nozzle for feeding a fluid in the vicinity of the top scum outlet.

17. Device according to claims 15 and 16, wherein there is a nozzle for feeding a fluid on the side of the bioreactor opposite the top scum outlet.

18. Device according to one of claims 12 to 17, wherein the nozzle has a diameter of 50 - 120 mm.